Manual de Usuario / User's Manual

reference series

Antes de utilizar el equipo, lea la sección "Precauciones de seguridad" de este manual. Conserve este manual para futuras consultas.

Before operating the device, please read the "Safety precautions" section of this manual. Retain this manual for future reference.

reference series

Precauciones de Seguridad
Safety Precautions

Cajas acústicas pasivas / Passive loudspeaker enclosures

Conserve y lea todas estas instrucciones.
Siga todas las advertencias.
El signo de exclamación dentro de un triángulo indica la existencia de componentes internos cuyo reemplazo puede afectar a la seguridad.

Keep these instructions.
Heed all warnings. Follow all instructions.
The exclamation point inside an equilateral triangle indicates the existence of internal components whose substitution may affect safety.

El doble cuadrado indica equipo de Clase II.

The double square indicates Class II device.

Las especificaciones se encuentran en la etiqueta de la parte posterior del producto.

The specifications can be found on the rear label of the product.

El colgado del equipo sólo debe realizarse utilizando los herrajes de colgado recomendados y por personal cualificado. No cuelgue la caja de las asas.

The appliance should be flown only from the rigging points and by qualified personnel. Do not suspend the box from the handles.

No exponga este equipo a la lluvia o humedad. No exponga el equipo a salpicaduras ni coloque sobre él objetos que contengan líquidos, tales como vasos y botellas. Equipo IP-20.

Do not expose this device to rain or moisture. Do not place any objects containing liquids, such as bottles or glasses, on the top of the unit. Do not splash liquids on the unit. IP-20 equipment.

Este símbolo indica que el presente producto no puede ser tratado como residuo doméstico normal, sino que debe entregarse en el correspondiente punto de recogida de equipos eléctricos y electrónicos.

This symbol on the product indicates that this product should not be treated as household waste. Instead it shall be handed over to the appicable collection point for the recycling of electrical and electronic equipment.

Equipo diseñado para funcionar entre 15ºC y 35ºC con una humedad relativa máxima del 75%.

Working temperature ranges from 15ºC to 35ºC with a relative humidity of 75%.

El cableado exterior conectado al equipo requiere de su instalación por una persona instruida o el uso de cables flexibles ya preparados.

The outer wiring connected to the device requires installation by an instructed person or the use of a flexible cable already prepared.

El equipo cuenta con dos conectores de entrada en paralelo para facilitar la conexión de varias cajas en paralelo.

Note that the two Speakon input connectors are wired in parallel to provide easy parallel connection of several enclosures.

No emplace altavoces en proximidad a equipos sensibles a campos magnéticos, tales como monitores de televisión o material magnético de almacenamiento de datos.

Do not place loudspeakers in proximity to devices sensitive to magnetic fields such as television monitors or data storage magnetic material.

Para las cajas con vaso para trípode, la altura máxima de seguridad desde el suelo a la base de la caja montada sobre trípode modelo ***TRD-2*** con pies a su máxima extensión es:

Rf-12.85 ---------->115 cm
Rf-15.85 ---------->105 cm
Rf-12.64 ---------->115 cm
Rf-15.64 ---------->105 cm

For enclosures with tripod socket, maximum safety height from floor to bottom of enclosure when mounting on a ***TRD-2*** tripod with legs fully open:

Rf-12.85 ---------->115 cm
Rf-15.85----------->105 cm
Rf-12.64----------->115 cm
Rf-15.64----------->105 cm

No existen partes ajustables por el usuario en el interior de este equipo. Cualquier operación de mantenimiento o reparación debe ser realizada por personal cualificado. Es necesario el servicio técnico cuando el aparato se haya dañado de alguna forma, tal como que haya caído líquido o algún objeto en el interior del aparato, haya sido expuesto a lluvia o humedad, no funcione correctamente o haya recibido un golpe.

No user serviceable parts inside. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

Limpie con un paño seco. No use limpiadores con disolventes.

Clean only with a dry cloth. Do not use any solvent based cleaners.

GARANTÍA

Todos nuestros productos están garantizados por un periodo de 24 meses desde la fecha de compra.

Las garantías sólo serán válidas si son por un defecto de fabricación y en ningún caso por un uso incorrecto del producto.

Las reparaciones en garantía pueden ser realizadas, exclusivamente, por el fabricante o el servicio de asistencia técnica autorizado.

Otros cargos como portes y seguros, son a cargo del comprador en todos los casos.

Para solicitar reparación en garantía es imprescindible que el producto no haya sido previamente manipulado e incluir una fotocopia de la factura de compra.

WARRANTY

All D.A.S. products are warrantied against any manufacturing defect for a period of 2 years from date of purchase.

The warranty excludes damage from incorrect use of the product.

All warranty repairs must be exclusively undertaken by the factory or any of its authorised service centers.

To claim a warranty repair, do not open or intend to repair the product.

Return the damaged unit, at shippers risk and freight prepaid, to the nearest service center with a copy of the purchase invoice.

DECLARACIÓN DE CONFORMIDAD
DECLARATION OF CONFORMITY

D.A.S. Audio, S.A.
C/ Islas Baleares, 24 - 46988 - Pol. Fuente del Jarro - Valencia. España (Spain).

Declara que la ***serie reference***:
Declares that ***reference series***:

Cumple con los objetivos esenciales de las Directivas:
Abide by essential objectives relating Directives:

- Directiva de Baja Tensión (Low Voltage Directive) 2006/95/CE
- Directiva de Compatibilidad Electromagnética (EMC) 2004/108/CE
- Directiva RoHS 2002/95/CE
- Directiva RAEE (WEEE) 2002/96/CE

Y es conforme a las siguientes Normas Armonizadas Europeas:
In accordance with Harmonized European Norms:

- EN 60065:2002 Audio, video and similar electronic apparatus. Safety requirements.
- EN 55103-1:1996 Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1:Emission.
- EN 55103-2:1996 Electromagnetic compatibility. Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2:Immunity.

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INTRODUCTION

General

Thank you for purchasing a D.A.S. product. The ***reference*** series represents more than 30 years of expertise in transducer and enclosure design, achieving a series of systems that utilize the most advanced sound reinforcement technology to deliver outstanding audio performance and maximum reliability.

This manual contains the required information to make the best use of the system you have purchased. Please take the time to read it.

Our Web ***www.dasaudio.com*** contains further support information such as enclosure and system drawings, data for modelling software, architectural specifications and specification sheets.

Series features

- High frequency compression drivers with pure titanium diaphragms and Neodymium magnet structures (except models with small format HF drivers, which use ferrite magnets).
- Rugged enclosures manufactured from 18mm Finnish Wisa® plywood for rigidity and durability.
- Bar handles or hand locations for easy transport.
- Finished in water based black paint that provides protection against the elements and abrasion. The finish may be painted on to complement the decor.
- Polyamide powder coated front grilles prevent corrosion and maintain good looks. On the ***Rf series***, the grilles are covered with acoustically transparent cloth for protection against rain, dust and dirt.
- Dual NL4 Speakon input/output connectors.
- Tripod mountable (depending on the model).
- Flying points (eyebolt based).
- Optional flying accessories.
- Flying accesories exist for configurations of 2 or 3 units ***AXA-xRFxx***).
- White systems available.
- Two basic system types:
    - Short/Mid throw systems, including horns with 80ºH x 50º V nominal dispersion.
    - Mid/large throw systems including horns with 60º H x 40º V nominal dispersion.
- Short/Mid throw systems include 3”voice coil speakers and 2” voice coil compression drivers.
- Mid/Large throw systems include 4”voice coil speakers and 3” voice coil compression drivers.
- Rotatable horns.

Model’s features

Rf-12.85

- Two-way full-range system.
- Trapezoidal enclosure.
- Tripod socket.
- Passive (full-range) use.
- 1 x 12" woofer with 3” voice coil diameter.
- Small format compression driver with ASC protection.
- Medium power.
- Medium sensitivity.
- Short / medium throw.
- Rotatable horn.
- Nominal horn coverage angles (-6 dB): 80ºH x 50ºV.
- Sound reinforcement for fixed installations. Pubs, restaurants, discos, indoor sport arenas. Stand-alone or subwoofer reinforced.
- Secondary area fills.

Rf-15.85

- Two-way full-range system.
- Trapezoidal enclosure.
- Tripod socket.
- Passive (full-range) use.
- 1 x 15" woofer with 3” voice coil diameter.
- Small format compression driver with ASC protection.
- Medium power.
- Medium sensitivity.
- Short / medium throw.
- Rotatable horn.
- Nominal horn coverage angles (-6 dB): 80ºH x 50ºV.
- Sound reinforcement for fixed installations. Pubs, restaurants, discos, indoor sport arenas. Stand-alone or subwoofer reinforced.
- Secondary area fills.

Rf-215.85

- Two-way full-range system.
- Trapezoidal enclosure.
- Passive (full-range) use.
- 2 x 15” speakers; 3” voice coil diameter.
- Small format compression driver with ASC protection.
- Medium / high power.
- Medium sensitivity.
- Short/medium throw.
- Rotatable horn.
- Nominal horn coverage angles (-6 dB): 80ºH x 50ºV.
- Sound reinforcement for fixed installations. Pubs, live music bars.
- Medium power side-fill.

Rf-12.64

- Two-way full-range system.
- Trapezoidal enclosure.
- Tripod socket.
- Passive (full-range) use.
- 1 x 12" woofer; 4” voice coil diameter.
- Medium format compression driver (3” voice coil diameter) with ASC protection.
- Medium/high power.
- Medium sensitivity.
- Medium/large throw.
- Rotatable horn.
- Nominal horn coverage angles (-6 dB): 60ºH x 40ºV.
- Sound reinforcement for fixed installations. Pubs, restaurants, discos, indoor sport arenas.
- Secondary area fills.

Rf-15.64

- Two-way full-range system.
- Trapezoidal enclosure.
- Tripod socket.
- Bi-amplified and passive (full-range) modes.
- 1 x 12" woofer; 4” voice coil diameter.
- Medium format compression driver (3” voice coil diameter) with ASC protection.
- Medium/high power.
- Medium sensitivity.
- Medium/large throw.
- Rotatable horn.
- Nominal horn coverage angles (-6 dB): 60ºH x 40ºV.
-Sound reinforcement for fixed installations. Pubs, restaurants, discos, indoor sport arenas.
- Secondary area fills.

Rf-215.96

- Two-way full-range system.
- Trapezoidal enclosure.
- Bi-amplified and passive (full-range) modes.
- 2 x 15" woofers; 4” voice coil diameter.
- Neodymium magnet large format compression driver, 4” voice coil diameter.
- Nominal horn coverage angles (-6 dB): 90ºH x 60ºV.
- High power.
- Medium / high sensitivity.
- Medium / long throw.
- Transport wheels.

sub-18G

- Sub-woofer system.
- Rectangular enclosure.
- Tripod socket for mid-high enclosures.
- 1 x 18" woofer; 4” voice coil diameter.
- Medium power.
- Medium sensitivity.
- Low frequency reinforcement for fixed installations. Pubs, bands, theaters.

sub-218G

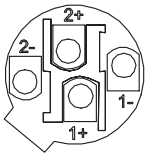
- Sub-woofer system.
- Rectangular enclosure.
- 2 x 18" woofers; 4” voice coil diameter.
- High power.
- Medium sensitivity.
- Low frequency reinforcement for fixed installations and mobile applications. Live sound, theaters, discos.

CONNECTIONS

Wiring

Reference series enclosures utilize two NL4 (four pin) Neutrik Speakon connectors. These connectors are specific for speaker use and allow a safe and professional connection. For plugging into an enclosure, insert the male connector into any of the inputs and rotate it clockwise. It will then lock into place and be ready for use.

The drawing illustrates the terminal arrangement detail:



NEUTRIK SPEAKON NL4

The enclosures provide two paralleled connectors. This allows for easy loop through from one speaker to the next. Unused connector pins are also paralleled. Both connectors can be used as either inputs or outputs.

To ensure quality sound and minimum power loss, the speaker cable needs to have a large enough cross section depending on the cable length, number of speakers per channel and speaker impedance. The total impedance for a number of speakers in parallel is equal to the impedance of one divided by the number of speakers. For instance, two ***Rf-12.85*** in parallel total 4 ohms (8 ohms divided by 2 boxes equal 4). It is particularly important to use a large enough gauge with those speakers that carry deep bass, such as ***sub-18G***, ***sub-218G*** o ***Rf-215.96***.

The tables show the minimum size for different runs of cable and four or eight ohms connected per channel:

8 ohms per amplifier channel			
Cable lenght		Minimum cable thickness	
metres	feet	mm2	Gauge number (AWG)
2,5	8	0,3	22
5	16	0,5	22
7,5	25	0,8	18
10	33	1,31	16
15	50	2,1	14
20	66	3,3	12
50	164	5,3	10
75	250	8,35	8
100	328	13,3	6
200	656	20,8	4
400	1312	33,3	2
4 ohms per amplifier channel			
Cable lenght		Minimum cable thickness	
metres	feet	mm2	Gauge number (AWG)
2,5	8	0,18	18
5	16	1,31	16
7,5	25	2,1	14
10	33	3,3	12
15	50	5,3	10
20	66	5,3	10
50	164	13,3	6
75	250	20,8	4
100	328	33,3	2
200	656	52,9	0
400	1312	80,2	000

- Use the eight ohm table when connecting a single eight ohm speaker per channel. For instance, one ***Rf-15.85*** in each channel of a stereo amplifier or the high frequency band of an ***Rf-215.96***.

- Use the four ohm table when connecting two eight ohm speakers to an amplifier channel. For instance, two ***Rf-1585*** units in parallel. Also for one four ohm speaker per channel, such as for one ***sub-218G*** per channel.

When connecting more than one speaker to an amplifier channel there are two wiring options. The first is to run cable from the amplifier's output terminals to each speaker. The second is to connect the closest speaker to the amplifier and then connect the two speakers together with a loop through cable that has a Speakon NL4 connector on both ends. We'll be paralleling speakers in both cases. The latter is the most common and practical option, the former providing a higher damping factor.

Never use a total impedance load that is lower than the lowest impedance that an amplifier will take. Virtually all professional amplifiers will accept loads down to four ohms safely in stereo mode. Many are rated for two ohm loads but often will run into overheating protection when used this way, particularly in high ambient temperature and high output power applications. Never connect more speakers to an amplifier's channel than it will take, i.e. do not load a channel with a total impedance that is lower than the minimum load specified by the manufacturer.

Avoid series or series-parallel wiring schemes for ***Rf series*** products, since they degrade sound quality and thus we do not recommend them for applications other than background music, paging, or surround sound.

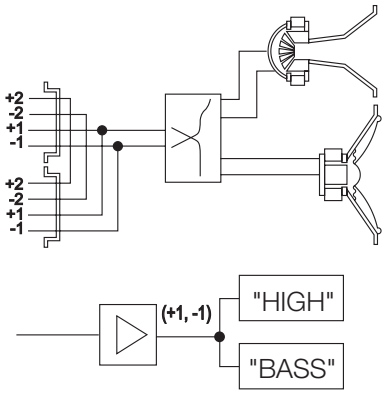
Basic connection

This section provides information on the pin assignments and basic set-up for the different enclosures. The "System Configurations" section adds stereo system configurations with or without sub-woofer reinforcement. The “Application Examples” section adds complete application specific system examples.

Some models, due to the complexities of their electronic processing, require the indicated D.A.S. controller for the system to run correctly. Others may use generic crossover units with recommended settings, although the use of the D.A.S. processors is recommended. In general, we stress the importance of the use of the D.A.S. processors, since they are shipped with set energy balances and crossover frequencies, and adjustments cannot be made that could endanger system components. By using the D.A.S. processors, we can ensure the correctness of the sound and the reliability of the systems.

Rf-12.85 Rf-15.85 Rf-12.64

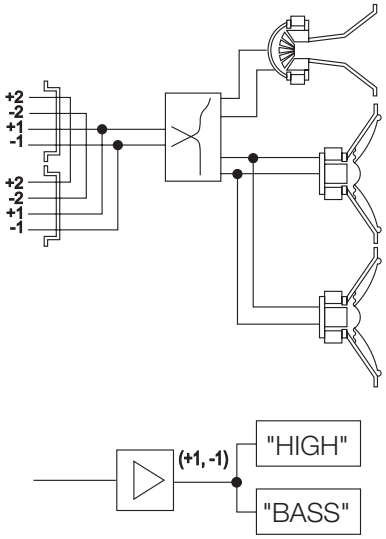
Figures show the block diagram and basic set-up for models ***Rf-12.85***, ***Rf-15.85*** and ***Rf-12.64***.



Passive (mono-amp) operation

Rf-215.85

Figures show the block diagram and basic set-up for model ***Rf-215.85***.

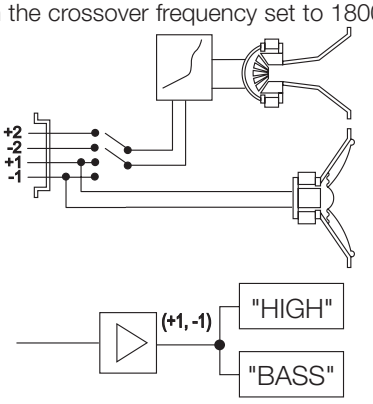


Passive (mono-amp) operation

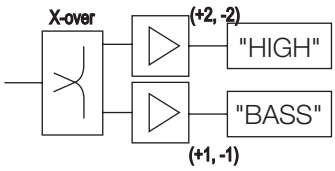
Rf-15.64

Figures show the block diagram and basic set-up for model ***Rf-15.64***. A switch, located at the input connector plate, allows to change between passive (full-range) and bi-amplified use. In passive use, the acoustical high frequency roll off of the low frequency section is used to crossover to the mid/high frequency section, which utilizes an equalized highpass filter network.

When using the system in active (bi-amplified) mode, use the D.A.S. ***DSP-26*** electronic processor or a 24 dB/octave electronic crossover unit with the crossover frequency set to 1800 Hz.



Passive (mono-amp) operation

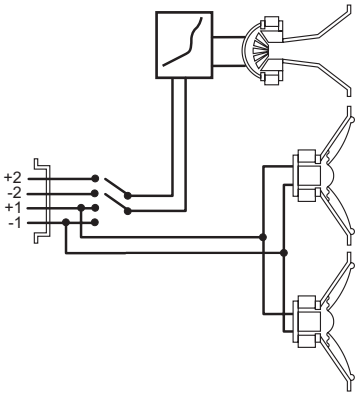


Active (bi-amp) operation

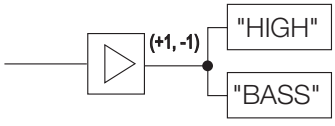
Rf-215.96

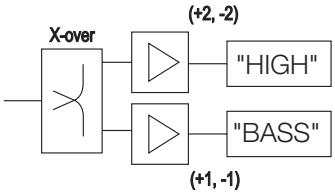
Figures show the block diagram and basic set-up. A switch located at the input connector plate, allows to change between passive (full-range) and bi-amplified use. In passive use, the acoustical high frequency roll off of the low frequency section is used to crossover to the mid/high frequency section, which utilizes an equalized highpass filter network.

When using the system in active (bi-amplified) mode, use the D.A.S. ***DSP-26*** electronic processor or a 24 dB/octave electronic crossover unit with the crossover frequency set to 1200 Hz.



Passive (mono-amp) operation

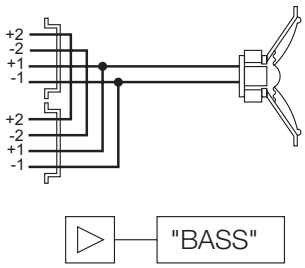




Active (bi-amp) operation

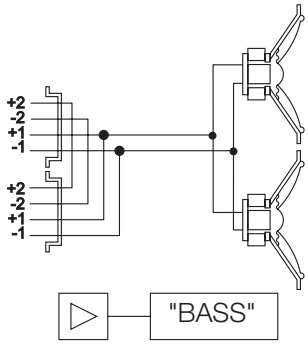
sub-18G

Figures show the block diagram and basic set-up. The ***sub-18G*** is a bass unit for active systems, so an electronic crossover will be required with a crossover frequency set in the range from 80 to 125 Hz.



sub-218G

Figures show the block diagram and basic set-up. The ***sub-218G*** is a bass unit for active systems, so an electronic crossover will be required with a crossover frequency set in the range from 80 to 125 Hz.



PLACEMENT AND MOUNTING

Placement

Place the speakers ahead of the microphones. Feedback (howling) occurs when the microphones pick up the sound that comes out of the speakers and feed it back to the system. Feedback can cause damage to the speaker system. If space is limited, direct the speakers towards areas where there are no microphones to minimize feedback.

When using a turntable, place the speakers far from the turntables. If the speaker signal is picked up by the stylus and reamplified, low frequency howling will occur. The use of a very heavy base for the turntable is recommended.

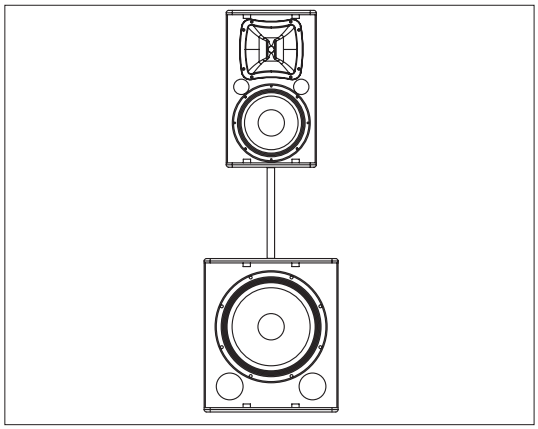
Bass output for bass cabinets in general will increase when placed against floors and/or walls. In this case, you may need to attenuate the gain of the low frequency section or use attenuation on the low frequency equalization.

Tripod use

The more portable models feature a tripod socket for use with standard 35-mm tripods such as the D.A.S. ***TRD-2***. Be careful not to raise the units too high on the tripod, as they may become unstable. Do not use a tripod on sloped surfaces.

Use on *sub-18G* with *TRD-5*

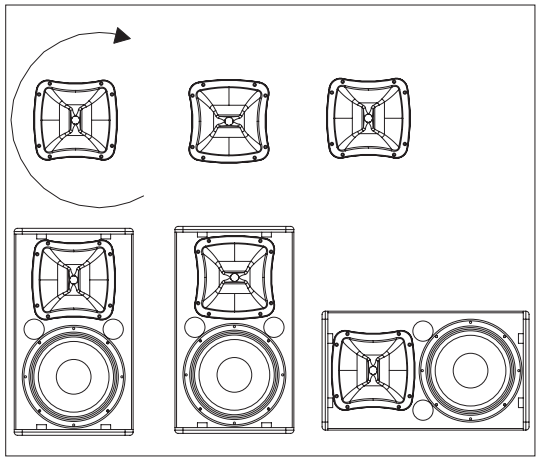
The top panel of model ***sub-18G*** features a tripod threaded socket for use with the optional TRD-5 poles. This allows pole mounting for systems that have tripod capability. The TRD-5 is a pole mount that is threaded at one end and has a 35 mm termination at the other. The TRD-5 raises the box 80 cm (32"). Do not use mounted systems on irregular floors or with slopes. With the KITW-100 caster kit, movement can be facilitated.



Rotating the horns

Models *Rf-12.85*, *Rf-15.85*, *Rf-12.64*, *Rf-15.64* have rotatable horns. This allows maintaining the original horn characteristics (wider horizontal coverage than vertical) when mounted in horizontal position. This feature is particularly useful in low ceiling rooms.

To rotate the horns you will need to remove the front grille first, then the horn. Then carefully rotate the horn 90 degrees, being careful not to disconnect the wires. Then screw the horn back into place and replace the grille.



Weather resistance

reference series cabinets are manufactured from phenolic plywood finished with a special water based black paint that protects the wood from water and humidity. Additionally, ***reference series*** units have an acoustically transparent cloth that will further protect the components from the rain.

Speaker cones are protected against humidity at the factory with a fine coat of varnish. If the speakers will be exposed to the elements, you may additionally treat the paper cones with a water repelling spray or by applying a coat of varnish. Always bear in mind that any coating should be very light so as not to change the weight of the cone significantly.

In fixed installations, do not expose the components to direct rain. For open-air applications, place the speakers under some form of canopy or cover.

RIGGING

Warnings

This manual contains needed information for flying D.A.S. Audio line array systems, description of the elements and safety precautions. To perform any operations related to flying the system, read the present document first, and act on the warnings and advice given. The goal is to the allow the user to become familiar with the mechanical elements required to fly the acoustic system, as well as the safety measures to be taken during set-up and teardown.

Only experienced installers with adequate knowledge of the equipment and local safety regulations should fly speaker boxes. It is the user's responsibility to ensure that the systems to be flown (including flying accessories) comply with state and local regulations.

The working load limits in this manual are the results of tests by independent laboratories. It is the user's responsibility to stay within safe limits. It is the user's responsibility to follow and comply with safety factors, resistance values, periodical supervisions and warnings given in this manual. Product improvement by means of research and development is on going at D.A.S. Specifications are subject to change without notice.

To this date, there is no international standard regarding the flying of acoustic systems. However, it is common practice to apply 5:1 safety factors for enclosures and static elements. For slings and elements exposed to material fatigue due to friction and load variation the following ratios must be met; 5:1 for steel cable slings, 4:1 for steel chain slings and 7:1 polyester slings. Thus, an element with a breaking load limit of 1000 kg may be statically loaded with 200 kg (5:1 safety factor) and dynamically loaded with 142 kg (7:1 safety factor).

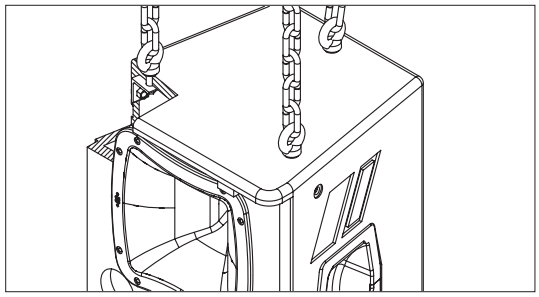
When flying a system, the working load must be lower than the resistance of each individual flying point in the enclosure, as well as each box. Hanging hardware should be regularly inspected and suspect units replaced if in doubt. This is important to avoid injury and absolutely no risks should be taken in this respect. It is highly recommended that you implement an inspection and maintenance program on flying elements, including reports to be filled out by the personnel that will carry out the inspections. Local regulations may exist that, in case of accident, may require you to present evidence of inspection reports and corrective actions after defects were found.

Absolutely no risks should be taken with regards to public safety. When flying enclosures from ceiling support structures, extreme care should be taken to assure the load bearing capabilities of the structures so that the installation is absolutely safe. Do not fly enclosures from unsafe structures. Consult a certified professional if needed. All flying accessories that are not supplied by D.A.S. Audio are the user's responsibility. Use at your own risk.

Introduction

Flyable ***reference series*** models feature 6 internal steel angles, with 2 mounting threads each, so that 12 flying points are available (2 on each side, 3 on the top panel and 3 on the bottom panel and 2 on the rear panel). Eyebolt flying points are factory sealed with M10 screws, which are replaced with eyebolts on the flying points as required. Flying with eyebolts is very economical and safe, and is specially recommended for fixed installations where the boxes are permanently fixed.

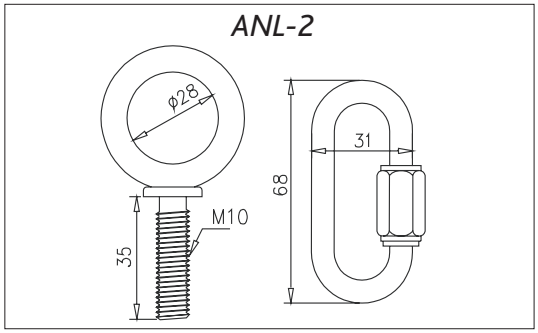
The illustration shows the internal metal hardware of an enclosure with eyebolt flying.



Flying with eyebolts

The Allen-head screws must be removed and replaced by M10 eyebolts on one side of the enclosure. Each rigging point has 200 kg (440 lb) working load limit. Then choose the slings or chains of required load resistance and length, bearing in mind that the length difference between the front and back slings or chains will determine the vertical orientation. Alternatively, the back bottom eyebolt points can be used to provide vertical orientation.

The ***ANL-2*** set is an optional set of four eyebolts and four carabiners. (Dimensions are in milimetres).

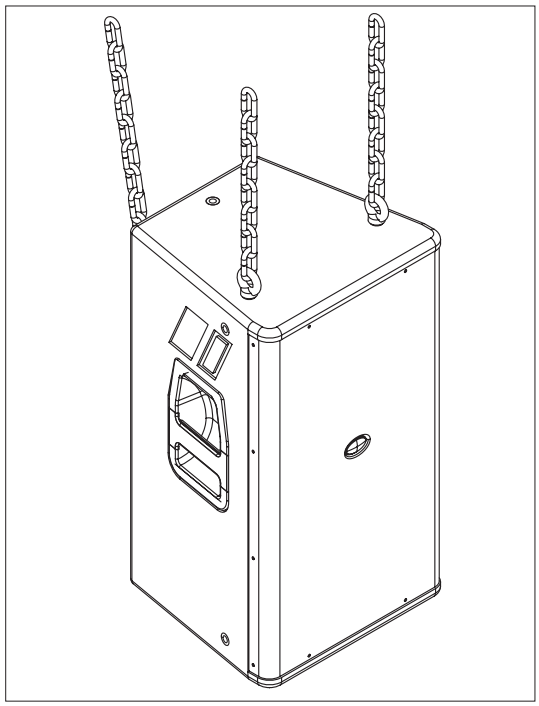


Each ***ANL-2*** eyebolt has a rated working load of 200 kg. (440 lb). Each ***ANL-2*** carabiner has a working load of 330 kg (726 lb). If using other hardware, make sure it is rated to handle the required load.

When using eyebolts it is important to bear in mind that the rated working load is only true for a load applied in the plane of the eye, and is significantly reduced for other angles. The drawing illustrates the concept. The table shows the variation of the working load as a function of the load angle. In the case of the ***ANL-2*** eyebolt, this means that the 200 kg working load becomes 60 kg at 45 degrees. Do not use eyebolt flying if the load angle is higher than 45 degrees.

	0 Degrees	30 Degrees	45 Degrees	More than 45 Degrees
% Working load	100%	65%	30%	25%

The following illustrations show different views on eyebolt flying for a single box. The length of the back cables or chains determines the vertical angle of the box.



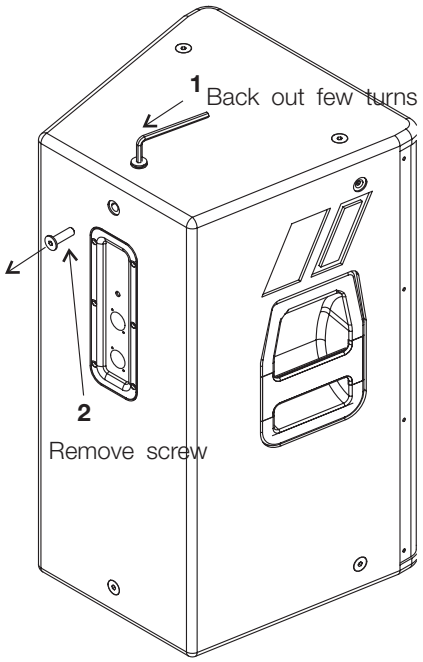
Rigging with *AX-TRUSS*

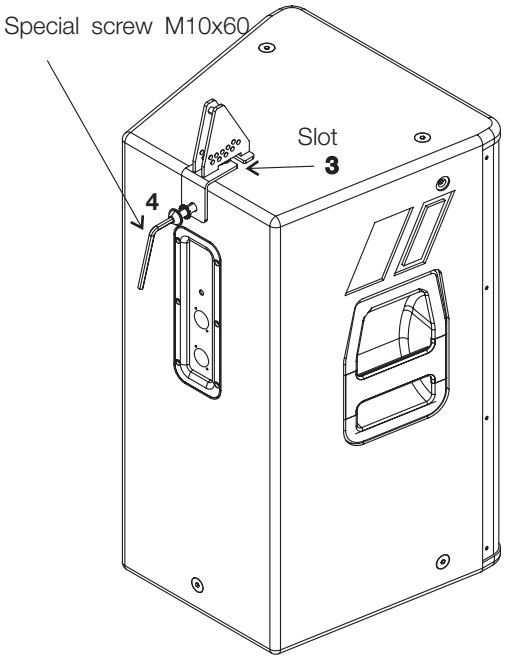
The ***AX-TRUSS*** rigging hardware has been designed to fly the cabinets from structure trusses of 50 mm diameter (2 in diameter). The ***AX-TRUSS*** base must be fixed to the upper rear corner of the box by means of two M10 screws. The screw needed to attach the ***AX-TRUSS*** base to the upper side of the box is the same that comes with the box on that position. The screw to be inserted on the rear side of the box is a special one that is provided with the ***AX-TRUSS*** accessory.

AX-TRUSS allows for several vertical angles from +10º to -35º. The vertical angle is set up by inserting a highly resistant quick release pin into the holes in the ***AX-TRUSS*** base.

In order to attach the ***AX-TRUSS*** to the box, firstly the screw on the upper rear side must be backed out a few turns (1). Then the rear side screw must be completely removed (2).

Once the rear side screw has been removed, the base of the ***AX-TRUSS*** will be placed on the corner, making sure that the head of the upper screw fits into the slot (3) on the base. Then the special rear side screw, provided with the hardware (4), will be fixed to the box.

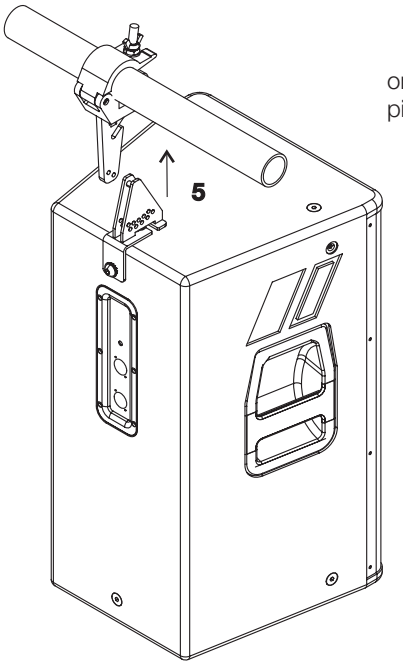




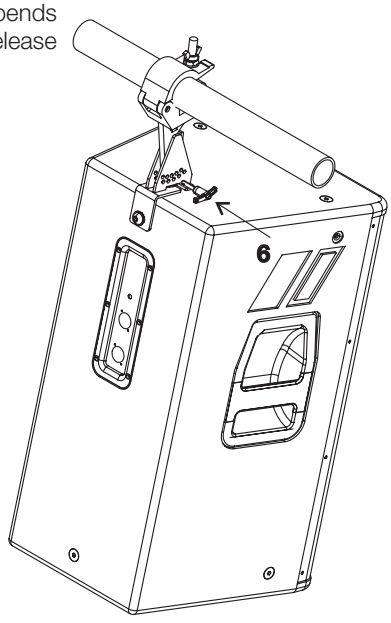
The next step will be to secure the fixing hardware part to the truss. In order to do so, the nut and the wing nut must be tightened. Make sure that the fixing hardware has been secured tightly to the truss, and that it is not able to swing. This way both parts of the rigging hardware will be fixed: one to the truss and the other one to the box.

Note: Maximum load capacity for ***AX-TRUSS*** is 50 kg. Never exceed this limit.

Once the fixing hardware has been attached to the truss, then the box can be attached (5).



The vertical splay angle depends on the hole where the quick release pin has been inserted (6).



Rigging with *AXA*

AXA-2RF12 / AXA-2RF15 **Array Frame.**

Mounting instructions.

1.- Flip the speakers upside down. Remove the existing speaker screws and rubber feet. Replace the screws used to attach the rubber feet to keep air from escaping.

2.- Position the speakers in the desired splay angle.

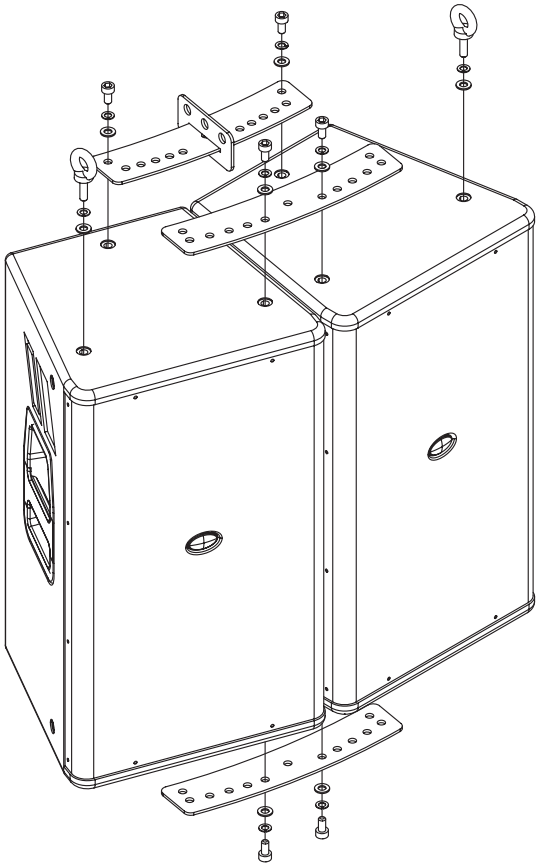
3.- Attach the joining plates to the enclosure using the holes on the concave side for the rear and the holes on the convex side to determine the angle. The holes closest to each other position the enclosures side to side, forming a 20º angle between them. Advancing toward the exterior alternate holes on each side increment the angles in 5º steps. It is recommended that the joining plate be placed as symetrically as pos-sible. Flat washers should be placed adjacent to the joining plates, followed by the lock washer and finally the bolt.

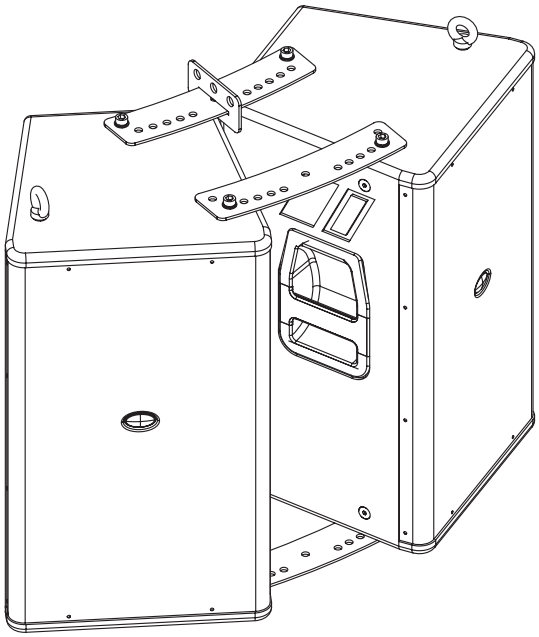
4.- Slowly flip the speaker assembly so that the tops of the speakers are facing up.

5.- Screw the joining plates to the enclosures positioning the one with rigging points in the rear so a pull point is available should we need steep vertical angling.

6.- Screw the eyebolts into the two remaining holes.

7.- Suspend the enclosures using the eyebolts and the joining plate with rigging points.





Package contents

4 joining plates (1 with rigging points) 8 M10x30 screws, 8 Grower (split) M10 lock washers, 8 M10 flat washers, 2 M10 eyebolts, 1 number 8 Allen (hex) wrench, 1 number 6 Allen wrench.

AXA-2RF12V / AXA-2RF15V **Array Frame.**

Mounting instructions.

1.- Flip the speakers upside down. Remove the existing speaker screws and rubber feet. Replace the screws used to attach the rubber feet to keep air from escaping.

2.- Position the speakers in the desired splay angle.

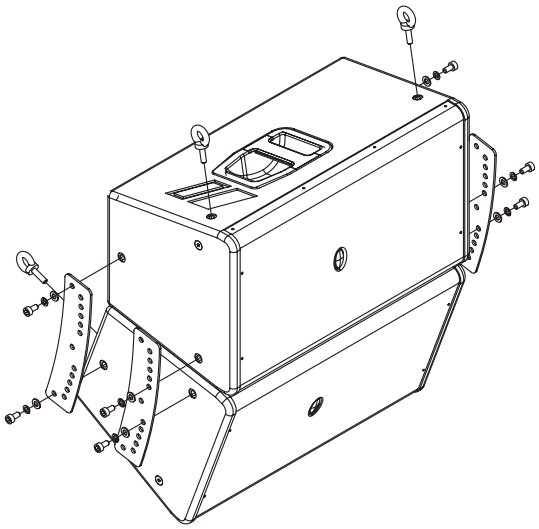
3.- Attach the joining plates to the enclosure using the holes on the concave side for the rear and the holes on the convex side to determine the angle. The holes closest to each other position the enclosures side to side, forming a 20º angle between them. Advancing toward the exterior alternate holes on each side increment the angles in 5º steps. It is recom-mended that the joining plate be placed as symetrically as pos-sible. Flat washers should be placed adjacent to the joining plates, followed by the lock washer and finally the bolt.

4.- Slowly flip the speaker assembly so that the tops of the speakers are facing up.

5.- Screw the joining plates to the enclosures.

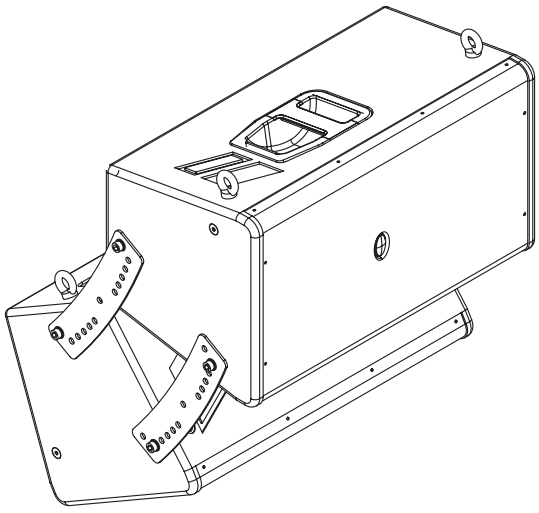
6.- Screw 2 eyebolts into the two holes on the side of the enclosure and the other 2 into the rear of the other enclosure.

7.- Suspend the enclosures using the eyebolts.



Package contents

4 joining plates, 8 M10x30 screws, 8 Grower (split) M10 lock washers, 8 M10 flat washers, 4 M10 eyebolts, 1 number 8 Allen (hex) wrench, 1 number 6 Allen wrench.



AXA-3RF12 / AXA-3RF15 **Array Frame.**

Mounting instructions.

1.- Flip the speakers upside down. Remove the existing speaker screws and rubber feet. Replace the screws used to attach the rubber feet to keep air from escaping.

2.- Position the speakers in the desired splay angle.

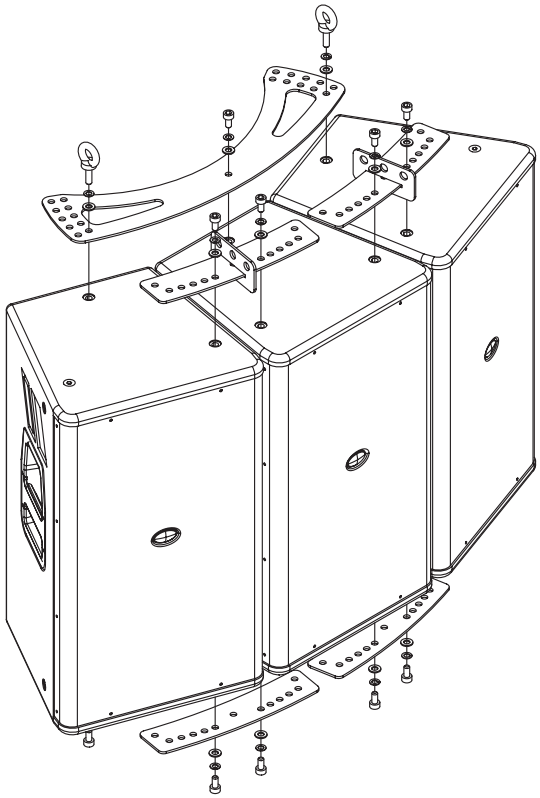
3.-Attach the joining plates to the enclosures using the short plates in front and the longer plates in the rear (see drawing). The holes closest to each other position the enclosures side to side, forming a 20º angle between them. Advancing toward the exterior alternate holes on each side increment the angles in 5º steps. It is recommended that the joining plate be placed as symetrically as possible. On the rear joining plates are two rows of holes on each side. The outer holes are for RF enclosures with a 15" bass and the internal holes are for units with a 12" bass. Flat washers should be placed adjacent to the joining plates, followed by the lock washer and finally the bolt.

4.- Slowly flip the speaker assembly so that the tops of the speakers are facing up.

5.- Screw the joining plates with rigging points to on the top-front of the enclosure.

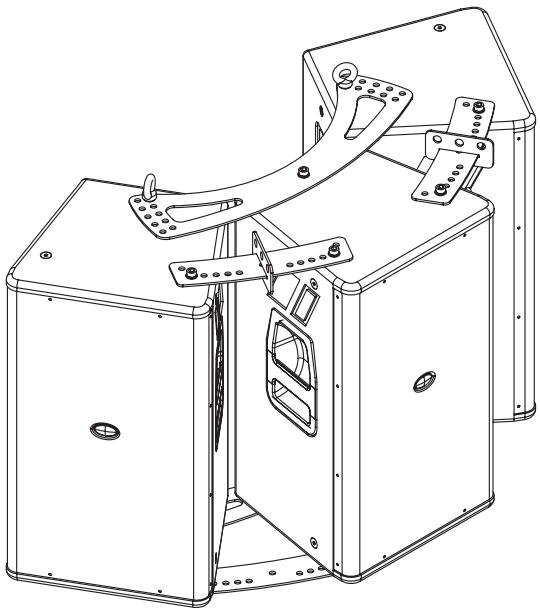
6.- Screw the rear joining plates to the enclosures using a screw in the center and eyebolts on the ends. If steep vertical angling is needed, the rear plate can be attached with 3 screws and the eyebolts can be used in the rear (with-out washers in this case) panel of the cabinet.

7.- Suspend the enclosures using the eyebolts and the joining plate with rigging points.



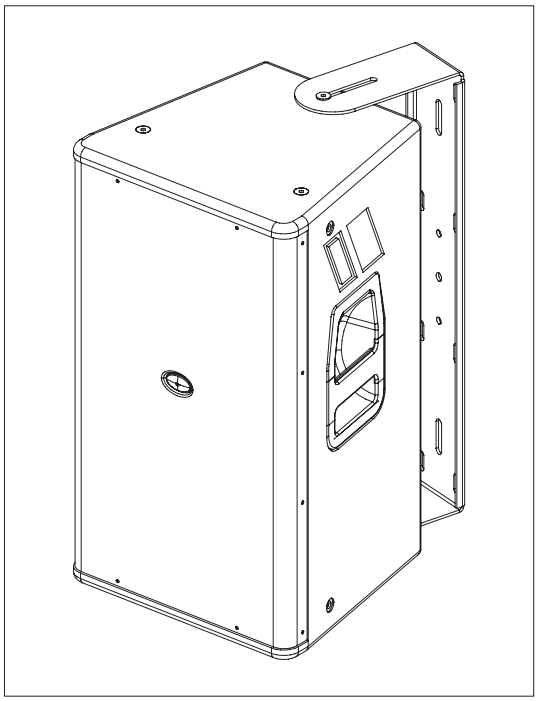
Package contents

4 joining plates (2 with rigging points), 2 rear joining plates, 14 M10x30 screws, 14 Grower (split) M10 lock washers, 14 M10 flat washers, 2 M10 eyebolts, 1 number 8 Allen (hex) wrench, 1 number 6 Allen wrench.

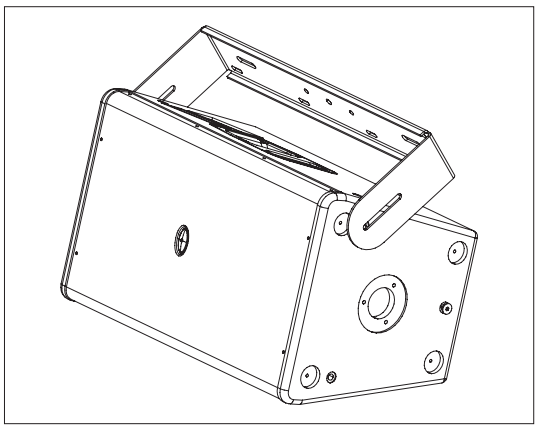


Rigging with *AXU*

AXU-RF12 is a wall mount accessory which is fixed to the internal metal structure included inside the ***Rf-12.64 / Rf-12.85***. By means of this accessory the unit can be fixed both vertically and horizontally. For ***Rf-15.64 / Rf-15.85*** cabients, the ***AXU*** accesory is ***AXU-RF15***.



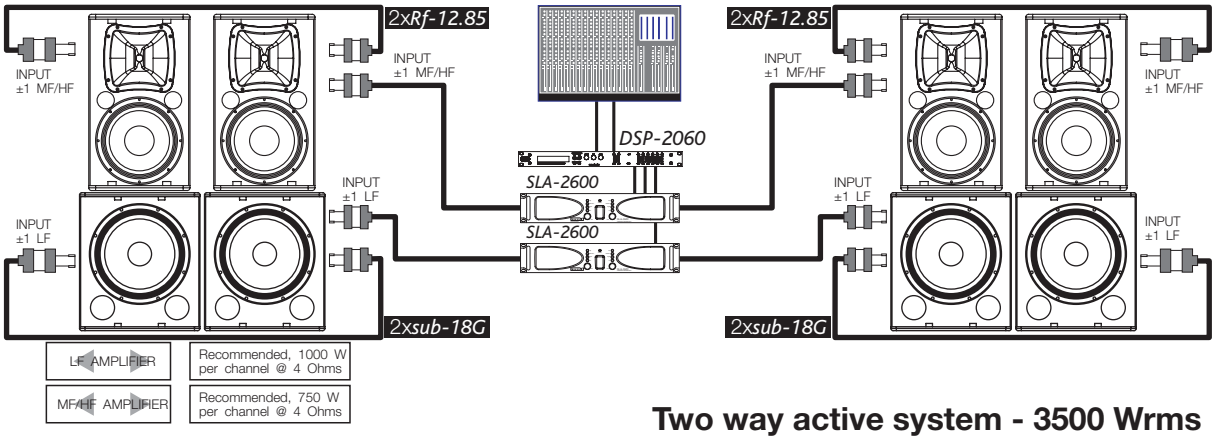
Rf-12.85 **fixed vertically**



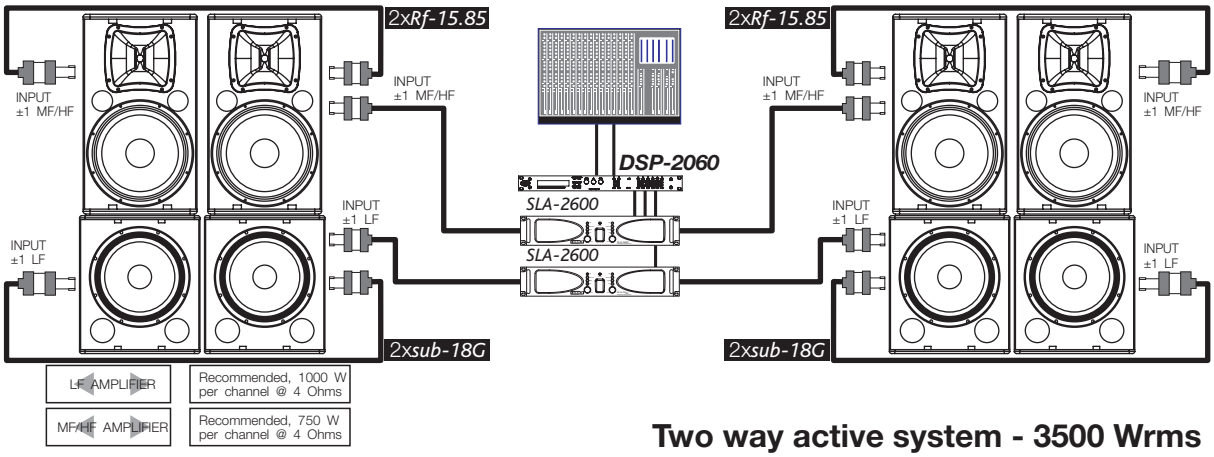
Rf-12.85 **fixed horizontally**

The ***AXU*** accessory can be fixed to the wall or the ceiling with 8mm screws and plugs. A total of eight screws and plugs are needed to do so. For more detailed information please refer to the instructions sheet included with every ***AXU*** accessory.

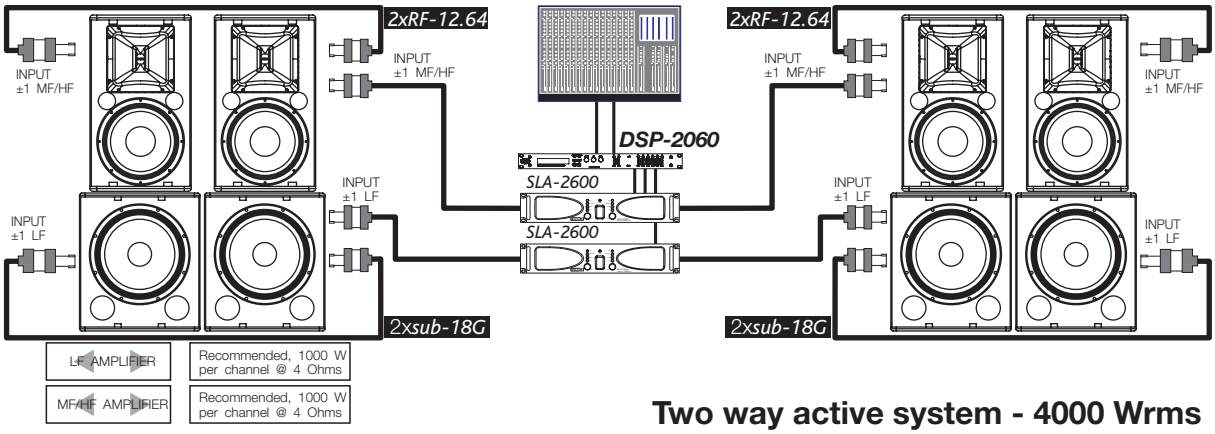
CONFIGURATIONS



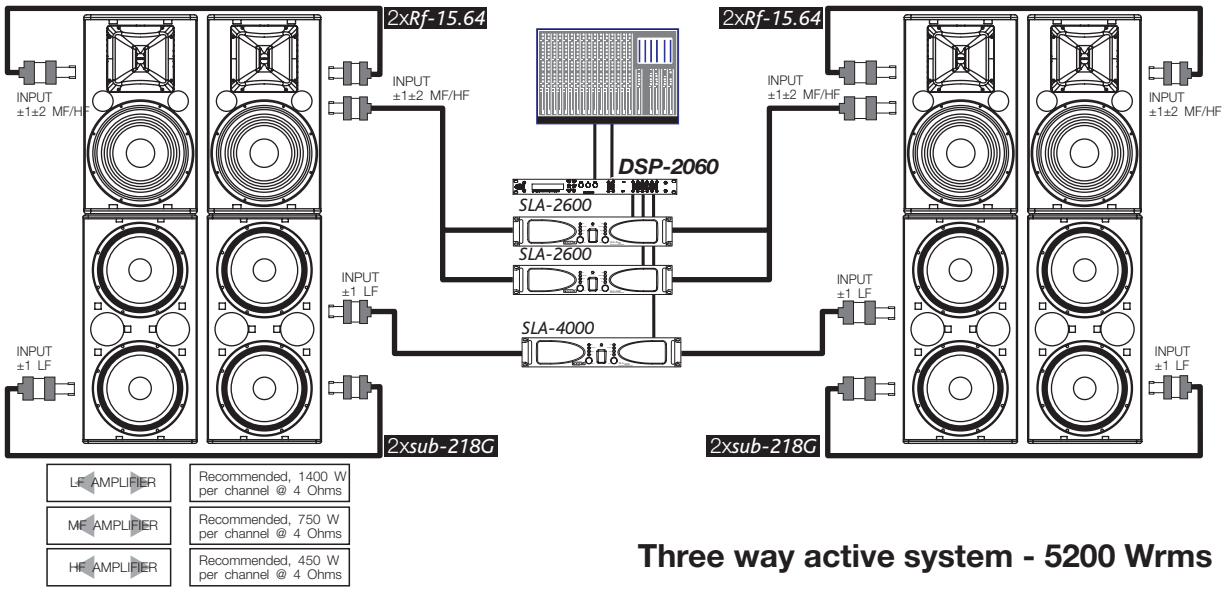
Two way active system - 3500 Wrms



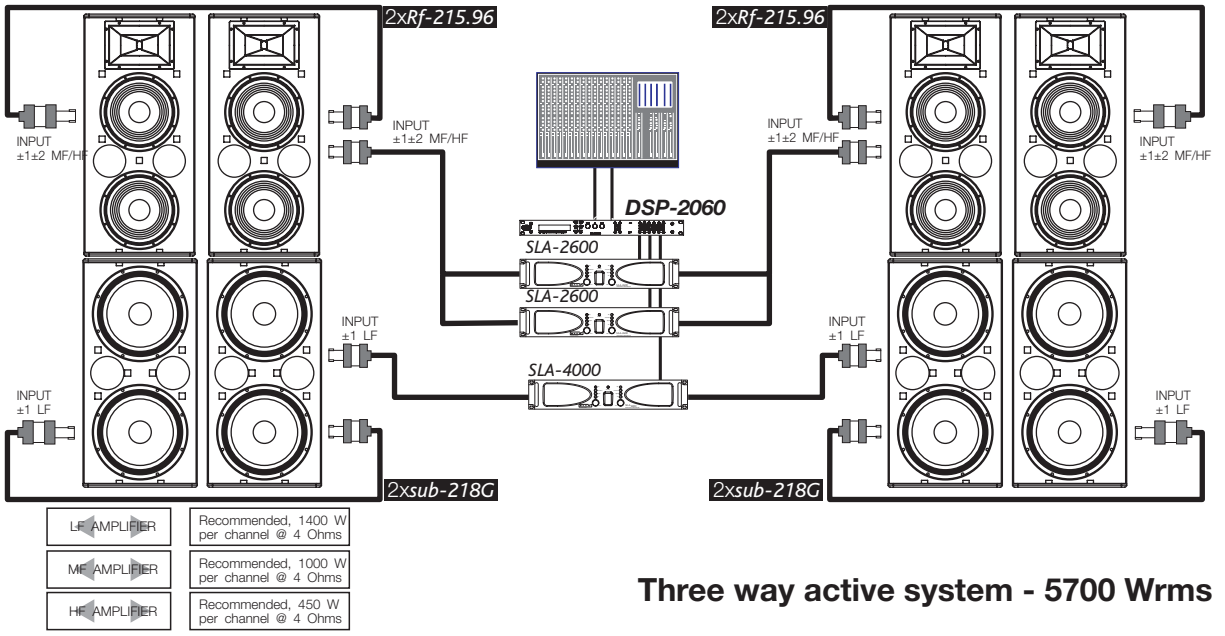
Two way active system - 3500 Wrms



Two way active system - 4000 Wrms



Three way active system - 5200 Wrms

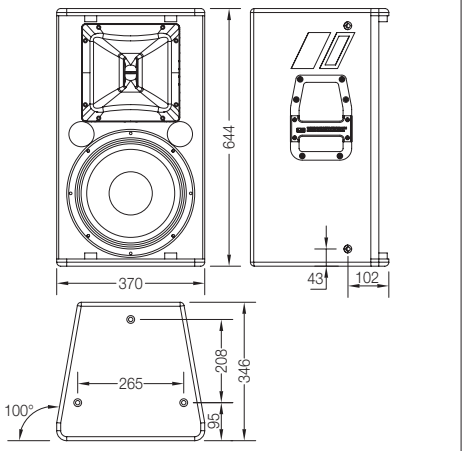


Three way active system - 5700 Wrms

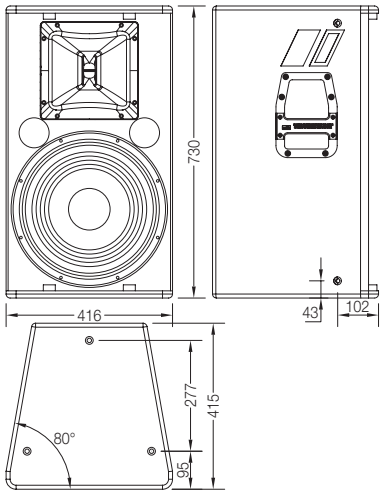
LINE DRAWINGS

ALL DIMENSIONS IN MILIMETERS

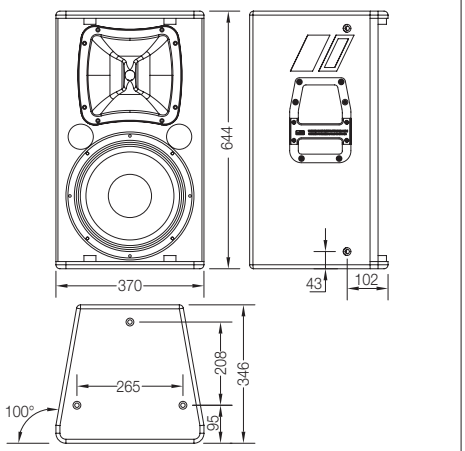
Rf-12.64



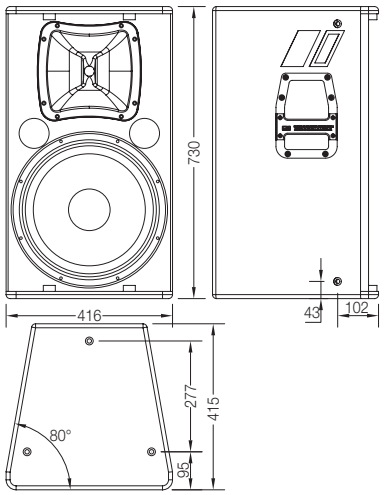
Rf-15.64



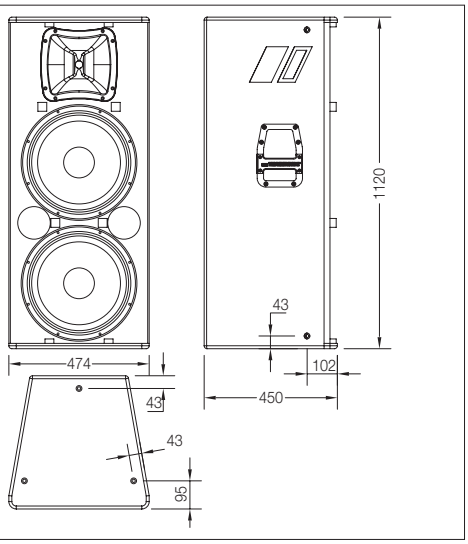
Rf-12.85

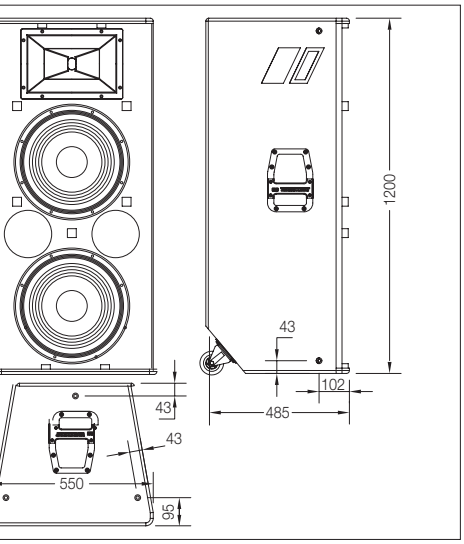


Rf-15.85



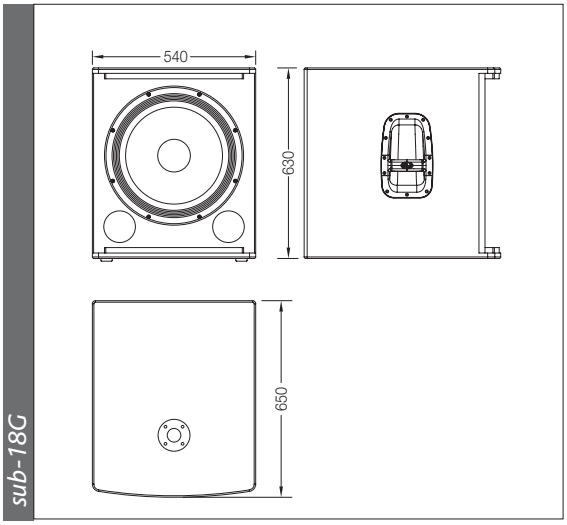
Rf-215.85

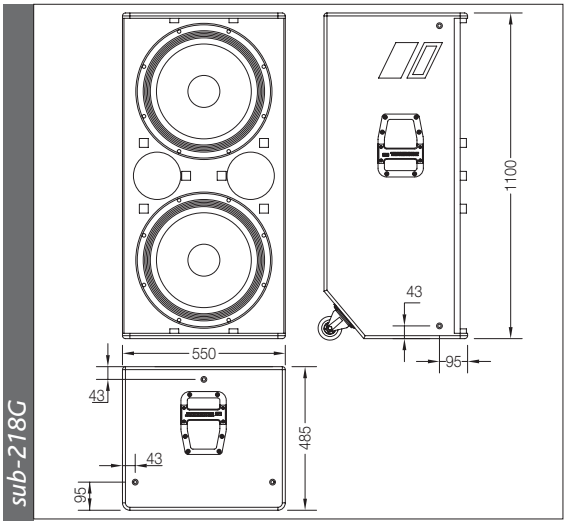




LINE DRAWINGS

ALL DIMENSIONS IN MILIMETERS





SPECIFICATIONS

Model	*Rf-12.85*	*Rf-15.85*	*Rf-215.85*	*Rf-12.64*
RMS Power Handling (1)	400 W	400 W	800 W	600 W
Peak Power Handling (-10 dB)	1600W	1600W	3200W	2400W
Frequency Range (-10 dB)	54 Hz - 20kHz	50 Hz - 20kHz	45 Hz - 20kHz	50 Hz - 20kHz
HF Horn Coverage Angles(-6dB)	80º x 50º	80º x 50º	80º x 50º	60º x 40º
On-axis Sensitivity 1 W / 1m	98 dB SPL	99 dB SPL	101 dB SPL	97 dB SPL
Rated Maximum Peak SPL (2)	130 dB	131 dB	136 dB	131 dB
Nominal Impedance	8 ohms	8 ohms	4 ohms	8 ohms
Transducers/Replacement Parts	LF: *12P* / *GM 12P* HF: *M-30* / *GM M-50*	LF: *15P* / *GM 15P* HF: *M-30* / *GM M-50*	LF: 2 x *15P* / *GM 15P* HF: *M-50* / *GM M-50*	LF: *12H* / *GM 12G* HF: *M-10N* / *GM M-10*
Enclosure Material	Birch Plywood	Birch Plywood	Birch Plywood	Birch Plywood
Color/Finish	Black Paint	Black Paint	Black Paint	Black Paint
Rigging System	Included: 12 x M10 rigging points	Included: 12 x M10 rigging points	Included: 12 x M10 rigging points	Included: 12 x M10 rigging points
Connectors	2 x NL4 Speakon	2 x NL4 Speakon	2 x NL4 Speakon	2 x NL4 Speakon
Dimensions (H x W x D)	64.4 x 37 x 34.6 cm 25.4 x 14.6 x 13.6 in	73 x 41.6 x 41.5 cm 28.7 x 16.4 x 16.3 in	112 x 47.4 x 45 cm 44.1 x 18.7 x 17.7 in	64.4 x 37 x 34.6 cm 25.4 x 14.6 x 13.6 in
Weight	22 kg (48.4 lb)	26 kg (57.2 lb)	44 kg (96.8 lb)	25 kg (55 lb)
Accessories	*ANL-2*, *AX-TRUSS*, *AXU-RF12*, *TRD-2*, *TRD-4* *TRD-5*, *AXA-2RF12*, *AXA-3RF12*	*ANL-2*, *AX-TRUSS*, *AXU-RF15*, *TRD-2*, *TRD-4* *TRD-5*, *AXA-2RF15*, *AXA-3RF15*	*ANL-2*	*ANL-2*, *AX-TRUSS*, *AXU-RF12*, *TRD-2*, *TRD-4* *TRD-5*, *AXA-2RF12*, *AXA-3RF12*

Model	*Rf-15.64*	*Rf-215.96*	*sub-18G*	*sub-218G*
RMS Power Handling (1)	Passive: 600 W LF: 600 W HF: 100 W	Passive: 1400 W LF: 1400 W HF: 200 W	700 W	1400 W
Peak Power Handling (-10 dB)	Passive: 2400W LF: 2400 W HF: 400 W	Passive: 5600W LF: 5600 W HF: 800 W	2800W	5600W
Frequency Range (-10 dB)	45 Hz - 20kHz	37 Hz - 20kHz	35 Hz - 160 Hz	27 Hz - 160 Hz
HF Horn Coverage Angles(-6dB)	60º x 40º	90º x 60º		
On-axis Sensitivity 1 W / 1m	LF: 98 dB SPL / HF: 99 dB SPL	LF: 102 dB SPL / HF: 101 dB SPL	98 dB SPL	101 dB SPL
Rated Maximum Peak SPL (2)	LF: 131 dB / HF: 132 dB	LF: 139 dB / HF: 130 dB	132 dB	138 dB
Nominal Impedance	Passive: 8 ohms LF/HF: 8 ohms	Passive: 4 ohms LF: 4 ohms HF: 8 ohms	8 ohms	4 ohms
Transducers/Replacement Parts	LF: *15H* / *GM 15G* HF: *M-10N* / *GM M-10*	LF: 2 x 15G / GM 15G HF: ND-10 / GM K-8H	LF: *18G* / *GM 18G*	LF: 2 x *18G* / *GM 18G*
Enclosure Material	Birch Plywood	Birch Plywood	Birch Plywood	Birch Plywood
Color/Finish	Black Paint	Black Paint	Black Paint	Black Paint
Rigging System	Included: 12 x M10 rigging points	Included: 12 x M10 rigging points		Included: 12 x M10 rigging points
Connectors	2 x NL4 Speakon	2 x NL4 Speakon	2 x NL4 Speakon	2 x NL4 Speakon
Dimensions (H x W x D)	73 x 41.6 x 41.5 cm 28.7 x 16.4 x 16.3 in	120 x 55 x 48.5 cm 47.2 x 21.7 x 19.1 in	63 x 54 x 65 cm 24.8 x 21.3 x 25.6 in	110 x 55 x 48.5 cm 43.3 x 21.7 x 19.1 in
Weight	31 kg (62.2 lb)	62.5 kg (137.5 lb)	38.4 kg (84.6 lb)	60 kg (132 lb)
Accessories	*ANL-2*, *AX-TRUSS*, *AXU-RF15*, *TRD-2*, *TRD-4* *TRD-5*, *AXA-2RF15*, *AXA-3RF15*	*ANL-2*	*TRD-5*, *KITW-100*	*ANL-2*

(1) Based on a 2 hour test continuosly applying 6 dB crest factor pink noise (IEC shaped).
(2) Maximum calculated Peak SPL based on sensitivity and RMS power handling.

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UM_RF_03

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